# Biotechnology Notes

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*Biotechnology Notes, a compilation of news events, program activities, and upcoming meetings, is prepared for members of the U.S. Department of Agriculture's Committee on Biotechnology in Agriculture by USDA's Office of Agricultural Biotechnology.*

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## INSIDE USDA

### IN SEARCH OF PINE GENES: FOREST SERVICE BEGINS PILOT STUDY

What is the world's most planted tree? If you answered the loblolly pine, then you probably already know about this tree's great economic value to the South where millions of loblollies are planted each year. That is one of the main reasons why the Forest Service's (FS) Southern Station in Gulfport, Miss., is very concerned about improving the pine's genetic resistance to fusiform rust, a fungus disease that kills young trees. For three decades, the FS has used traditional genetic methods to build up the tree's resistance. Now, it is looking at biotechnology as a means of accelerating the project.

Last May, the FS began a pilot study to test the feasiblity of using a technique for gene mapping called restriction fragment length polymorphism (RFLP). If successful, gene mapping could help to find the genes responsible for disease resistance. RFLP is already used in humans and crop plants.

The pilot study is a cooperative effort in which the Southern Station has joined forces with the University of Kentucky, University of Tennessee, Texas A&M, and Alabama A&M. The schools provide researchers who are experts in molecular genetics, while the Southern Station offers both the plant material and its expertise in traditional genetics. The study is scheduled to conclude in September.

### AGRICULTURAL RESEARCH SERVICE LAB PLACES CITRUS CANKER "UNDER ARREST"

Using a technique called genetic "DNA fingerprinting", researchers at the Agricultural Research Service's (ARS) Fruit Laboratory in the Plant Sciences Institute, Beltsville, Md., have identified the three types of bacteria that cause citrus canker. Their research will help to distinguish citrus canker from other diseases, locate the country of origin for each type of the disease, and assist state and Federal regulators during outbreaks.

The technique involves taking all of the DNA out of the bacteria and analyzing it using electrophoresis. The DNA fragments separate on an electric field according to their size and then form contiguous bands. That pattern of bands, which could be as many as 100, is the fingerprint and is unique to that one strain of bacterium. To make it easier to read, the number of bands is then reduced to just a few. Partly as a result of this technique, researchers are now able to fingerprint other bacteria in both plants and animals.

## ANIMAL AND PLANT HEALTH INSPECTION SERVICE LICENSES FIRST DUAL-USE DIAGNOSTIC KIT FOR FELINE DISEASES

The Animal and Plant Health Inspection Service recently issued a U.S. veterinary biological product license to Agritech Inc., Portland, Maine, for an unusual veterinary biologic diagnostic kit. The Feline Leukemia Lentivirus Antibody Test Kit simultaneously detects two diseases in cats instead of the standard one kit/one disease product now on the market.

Using monoclonal antibodies, the kit detects feline leukemia virus antigen and feline T-lymphotropic lentivrus (feline AIDS antibody). Both viruses cause a series of disorders in cats which have been difficult to diagnose based on clinical information alone.

## COOPERATIVE STATE RESEARCH SERVICE GRANT PROPOSALS RUN THE GAMUT

If it walks, crawls, swims, or flies and can be genetically engineered, the Cooperative State Research Service's Competitive Research Grants Office probably knows about it. Some of the more unusual proposals the office reviewed this year dealt with research on transgenic rainbow trout and sturgeon. Another recently reviewed proposal uses genetic engineering techniques on mosquito vectors of LaCrosse virus. Transposable elements would be used to stop virus replication within the insect, thus breaking the viral transmission cycle.

Projects that were recommended for funding include one to generate animals containing a gene to make them resistant to pathogenic viruses and one to continue research on a gene complex in the porcine immune system that is associated with increased litter size and increased piglet survival. Funding was also recommended for studies on the basic genetic mechanisms that contribute to the pathogenicity of Brucella abortus and Marek's disease virus.

## AGRICULTURAL MARKETING SERVICE APPROVES NEW VARIETY OF BELL PEPPERS

The Agricultural Marketing Service recently granted DNA Plant Technology Corporation, Cinnaminson, N.J., a Plant Variety Protection Act (PVPA) certificate for a new, nearly seedless variety of sweet bell pepper developed using gametoclonal variation. This is the first PVPA certificate ever issued for a new vegetable variety developed through this biotechnological process. A PVPA certificate, like a patent, gives a company protection for 18 years.

Seeds were collected from regenerated plants and field tested in New Jersey. From these tests, a gametoclone was isolated which retained the form and growth habit of the donor but with only about 20 seeds per pepper. One bell pepper normally averages about 300 seeds. All of the progeny in successive generations yielded low-seed fruit.

### TWO DETAILEES JOINING OFFICE OF AGRICULTURAL BIOTECHNOLOGY

Ms. Martha Steinbock, an international affairs specialist at the Office of International Cooperation and Development, and Dr. Phillip O'Berry, a veterinary medical officer with ARS in Ames, Iowa, will join OAB in August on a 4-month detail. Ms. Steinbock will work on developing the Department's position regarding the exchange of biotechnology information between USDA and foreign scientists. In addition, she will assist with USDA's input to the Organization of Economic Cooperation and Development's guidelines and develop a system for tracking major developments in international biotechnology research. Dr. O'Berry will analyze the impact of biotechnology on animal health issues.

## NEWS AND VIEWS AROUND THE COUNTRY

### SLEUTHING FOR BACTERIA AT CLEMSON

At the annual meeting of the American Association for the Advancement of Science, Clemson University researchers reported on the spread of genetically engineered microorganisms in the environment. The Clemson team observed that root-colonizing bacteria migrated a maximum of 7 inches horizontally and 12 inches vertically during the first 10 weeks of an 18-month field test. The bacteria were only found on the roots of inoculated plants and did not cross over to noninoculated plants.

### NEXT STOP, SINGAPORE

USDA has been invited to attend a major conference on biotechnology in the Pacific Rim this September in Singapore. The conference is a collaborative effort between the U.S. International Trade Administration and the State Department with the Singapore Economic Development Board. The governments of South Korea and Taiwan are cooperating on this project. Representing USDA will be Dr. Donald King, CSRS, and Dr. Fred Kuchler, detailed to OAB from the Economic Research Service.

The goal of the conference is to identify opportunities for collaboration and joint ventures between organizations and companies in the participating countries. The attendees include senior government officials, research directors, and industrial and financial executives from the United States, Korea, Singapore, South Korea, and Taiwan. Highlights of this meeting will appear in the October issue of Biotechnology Notes.

## NEW SCHOLARSHIP FUND ESTABLISHED

The RJR Nabisco National Scholars in Agriculture and Life Sciences Program is a $1 million joint venture between the National Association of State Universities and Land-Grant Colleges (NASULGC) and RJR to attract high-quality students to the agricultural sciences. RJR has pledged $640,000 and the schools have pledged $320,000 for these merit scholarships. The program will be managed by the agricultural division of NASULGC and the member colleges.

## BIOTECHNOLOGY LEADS THE WAY

A recent national opinion poll commissioned by Monsanto and conducted by the Wirthlin Group of McLean, Va., showed that biotechnology is the area of science that will have the greatest economic impact in the next decade. Superconductivity finished second on the list. The opinions were drawn from legislators, government officials, media representatives, and others. Biotechnology's greatest impact will be in health care, according to the poll, followed by agriculture. Those surveyed said ethics was the subject area they were most familiar with in biotechnology.

## IOWA STATE RECEIVES FIRST PERMIT

Federal and state agencies gave Iowa State University approval to conduct a field test of genetically engineered tobacco plants this summer, thus making that school the first university to receive such a permit.

## WHO SAID IT FIRST?

According to the June issue of Wisconsin: BioIssues, the term "genetic engineering" may have first been uttered in 1941 by A. Jost, a professor at the Technical Institute at Lwow, Poland. University of Wisconsin professor Waclaw Szybalski was a student in Poland at that time and remembers the term was used to describe research conducted by a Danish professor on the sexual reproduction of yeast. Jost told his students a new age of genetic engineering in fermentation was possible with the discovery that genes for enzymes produced by yeast were dominant and that enzymes from two species could be combined in daughter cells.

## IN CASE YOU WEREN'T THERE

- The Human Genome Subcommittee of the Committee on Life Sciences, a committee of the Federal Coordinating Counsel for Science, Engineering, and Technology, met June 24 in Washihngton D.C. USDA representative Dr. Robert Faust, acting national program leader at ARS, Plant and Natural Resource Sciences, gave an overview of ARS's program in genome research. Faust said about $750,000 is funded for research studies on corn and soybeans; $1 million is allocated to poultry, pigs, and cows.

Member agencies of the Human Genome Subcommittee include the Department of Energy (DOE), the National Science Foundation (NSF), the National Institutes of Health (NIH), and USDA. The next meeting is scheduled for August 3.

• Almost 700 agricultural communicators gathered in Washington, D.C., July 10-13 for the second meeting of the U.S. Agricultural Communicators' Congress. At the biotechnology session, Dr. Charles Benbrook, executive director for the National Academy of Sciences and Jeremy Rifkin, president of the Foundation on Economic Trends, discussed the present and future of biotechnology.

Rifkin said he has formed a global coalition in over 40 countries of farm organizations, consumer groups, environmentalists, religious leaders, food and health advocates, and the animal welfare community. The coalition will address the impact of the greenhouse effect and try to halt global warming through legislation, litigation, consumer boycotts, and public education.

The same coalition is also going to try and ban the commercial use of bovine growth hormone around the world through a consumer boycott campaign, scheduled to begin in the spring of 1989.

Rifkin's foundation has also called for an international moratorium on the deliberate release of genetically engineered organisms pending a thorough review of environmental and public health risks. According to Rifkin, West Germany, Denmark, and Japan already prohibit such releases.

• On July 20, Dr. Jim Cooke, a researcher from Washington State University and Dr. E. J. Brandt, regulatory manager at Monsanto, spoke to USDA at the Beltsville Agricultural Research Center. Dr. Cook discussed using biotechnology to prevent wheat take-all, a devastating fungal disease. He said his project is ready to be field tested. Dr. Brandt worked with Clemson University on a tracking system of a genetically engineered microbe applied to the soil in a wheat/soybean field. Dr. Cook plans to use a similar tracking system for his field test.

• The Environmental Protection Agency's Biotechnology Science Advisory Committee met July 15 to discuss procedures for minimizing the dissemination of genetically engineered microorganisms in field tests. "Minimizing dissemination" is the phraseology now used by EPA instead of "containment." The committee elaborated on points to consider for both land and aquatic tests. Minutes of the meeting will be made available to the public. Contact: Dr. Elizabeth Milewski at (202) 382-2892.

• Members of the OAB staff visited four projects at ARS's Beltsville facility July 14. Hosts included Drs. Waldemar Klassen, Robert Faust, and Graham Purchase. The first stop was CGI's test plot of genetically engineered corn.

The 275' x 250' site included 10 plots of experimental corn, a barren zone, security fence, fallow zone, and a deer fence. The site is patrolled around-the-clock.

The visit to the "mouse house", a biological level 3 containment facility, as well as a fruit propagation laboratory, were equally informative. The last stop -- a look at some transgenic pigs frolicking in their pens -- completed this worthwhile tour.

• Two **Agricultural Biotechnology Research Advisory Committee** (ABRAC) working groups met July 28 at USDA, following up on an initiative begun June 23 at the full committee meeting. These two groups, and a third that will meet in early August (see Calendar of Meetings), are fine-tuning sections of the proposed USDA Guidelines for Research Outside the Laboratory. The "definitions" group discussed working definitions for about a dozen key terms, including: biotechnology, release into the environment, plant, and pathogen. The "guidelines" group examined different levels of review for various field tests according to degrees of risk and other factors.

## NEW PUBLICATIONS

New Developments in Biotechnology: U.S. Investment in Biotechnology, is number 4 in a series of reports prepared by the Office of Technology Assessment. It found that 12 Federal agencies and one cross agency program spent about $2.7 billion in FY '87 to support biotechnology research and development. NIH contributed about $2.3 billion (84%); DOD, $119 million; NSF, $93.8 million; USDA, $84 million; and DOE, $61.4 million. Copies are available to the public fromt the U.S. Government Printing Office, Superintendant of Documents, Washington, D.C. 20402, or call (202) 783-3238. The GPO stock number is 052-003-01115-8. The price is $13.00.

Biotechnology: Managing the Risks of Field Testing Genetically Engineered Organisms, prepared by the U.S. General Accounting Office. This report evaluates the scope of regulatory policies, reviews the administrative procedures for implementing these policies, and identifies methods available to control and monitor field tests. The first five copies are free; additional copies are $2.00 each. There is a 25% discount on orders of 100 or more copies. Either write to the U.S. General Accounting Office, P.O. Box 6015, Gaithersburg, Md. 20877, or call (202) 275-6241.

## CALENDAR OF MEETINGS FOR AUGUST

August 1-5: Eighth International Conference on Global Impacts of Applied Microbiology. Hong Kong. Contact: S. T. Chang, Department of Biology, the Chinese University of Hong Kong, Shatin, New Territories, Hong Kong.

August 7-12: 1988 Annual Meeting of the Society for Industrial Microbiology. Chicago, Ill. Contact: Ann Kulback, SIM, P.O. Box 12534, Arlington, Va. 22209-8534.

August 7-13: 14th International Conference on Yeast Genetics and Molecular Biology. Espoo, Finland. Contact: Tarja Koistinen, Research Laboratories, Alko Ltd., P.O. Box 250, SR 00101, Helsinki 10, Finland.

August 9: Congressional Hearing. Subcommittee on Department Operations, Research, and Foreign Agriculture of the House Committee on Agriculture. The U.S. Capitol, Longworth House Office Bldg., Room 1300. The hearing focuses on S. 1966, "The Biotechnology Competitiveness Act of 1988;" and H.R. 5056, "The Omnibus Act" (not related to biotechnology.) Witness for the Department will be Dr. Robert Long, USDA's Deputy Assistant Secretary for Science and Education, accompanied by Dr. Alvin Young, USDA'S Director of the Office of Agricultural Biotechnology. The hearing is scheduled to begin at 1:30 p.m.; it is open to the public. Contact: Robert Myers at (202) 225-0301.

August 11-12: USDA's ABRAC working group on containment/confinement issues. Open to the public. USDA's Aerospace Bldg., 901 D St., S.W., Room 338-C, Washington, D.C. 20250. The meeting begins 9:00 a.m. both days and will end at 5:00 p.m. on Aug. 11 and 3:00 p.m. on Aug. 12. Contact: Marti Asner, USDA, OAB, 14th and Independence Ave., S.W., Room 508-A, Washington, D.C. 20250, or call (202) 447-8429.

August 14-19: 4th International Congress of Cell Biology. Montreal, Canada. Contact: Congress Secretariat, 4th International Congress of Cell Biology, National Research Council of Canada, Ottawa, Canada K1A OR6.

August 20-27: 16th International Congress of Genetics. Toronto, Canada. Contact: Congress Manager, 16th International Congress of Genetics, National Research Council of Canada, Ottawa, Canada K1A OR6.

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Suggestions for items to include in future issues of Biotechnology Notes may be addressed to Marti Asner, U.S. Department of Agriculture, OAB, Room. 508-A, Administration Bldg., 14th and Independence Ave., S.W., Washington, D.C., 20250, or call (202) 447-8429.